

WHAT IS CLAIMED IS:

1. A cutting tool insert for turning of steel comprising a cemented carbide body and a coating thereon, the cemented carbide body including WC, 5-11 wt % Co and 2-10 wt % cubic carbides of groups IVb, Vb and/or VIb of the periodic table and a highly W-alloyed binder phase with a CW-ratio of 0.76-0.92, the coating comprising:

a first layer of $\text{TiC}_x\text{N}_y\text{O}_z$ having a thickness of 0.1-2 μm and equiaxed grains <0.5 μm in size;

a second layer of $\text{TiC}_x\text{N}_y\text{O}_z$ having a thickness of 3-15 μm and columnar grains <5 μm in diameter; and

a third layer of a smooth, fine-grained $\kappa\text{-Al}_2\text{O}_3$ -layer having a thickness of 1-9 μm .

2. The cutting insert according to Claim 1, wherein the $\kappa\text{-Al}_2\text{O}_3$ -layer has a thickness of 1-3 μm .

3. The cutting insert according to Claim 1, wherein the $\kappa\text{-Al}_2\text{O}_3$ -layer has a thickness of 4-8 μm .

4. The cutting insert according to Claim 1, wherein the cemented carbide body has a surface zone depleted of cubic carbides.

5. The cutting insert according to Claim 1, wherein the cemented carbide body includes 6.5-8.0 wt % Co and has a CW-ratio of 0.80-0.90.

6. The cutting insert according to Claim 1, further comprising a fourth layer of TiN.

7. The cutting insert according to Claim 6, wherein the TiN-layer does not cover a cutting edge of the insert.

8. The cutting insert according to Claim 1, wherein the first layer is in contact with the cemented carbide body and the second layer is in contact with the first layer and the third layer, the third layer having a grain size of 0.5 to 2 μm .

9. The cutting insert according to Claim 1, wherein $x+y+z=1$ with $z < 0.5$ in the first layer and $x+y+z=1$ with $x > 0.3$ and $y > 0.3$ in the second layer.

10. The cutting insert according to Claim 6, wherein the fourth layer is in contact with the third layer and the fourth layer has a thickness of 0.1 to 1 μm .

11. The cutting insert according to Claim 4, wherein the surface zone has a thickness of 15 to 35 μm and the cubic carbides include TiC , TaC and/or NbC .

12. A method of coating a turning insert comprising a cemented carbide body including WC, 5-11 wt % Co and 2-10 wt % cubic carbides of groups IVb, Vb and/or VIb of the periodic table and a highly W-alloyed binder phase with a CW-ratio of 0.76-0.92, the method comprising:

coating the cemented carbide body with a first layer of $\text{TiC}_x\text{N}_y\text{O}_z$ having a thickness of 0.1-2 μm and equiaxed grains $< 0.5 \mu\text{m}$ in size by chemical vapor deposition;

coating the first layer with a second layer of $\text{TiC}_x\text{N}_y\text{O}_z$ having a thickness of 3-15 μm and columnar grains $< 5 \mu\text{m}$ in diameter by chemical vapor deposition at a temperature of 700 to 900°C while using acetonitrile as a source of carbon and nitrogen for the second layer; and

coating the second layer with a third layer of a smooth, fine-grained $\kappa\text{-Al}_2\text{O}_3$ -layer having a thickness of 1-9 μm .

13. The method of Claim 12, wherein the $\kappa\text{-Al}_2\text{O}_3$ -layer is deposited in a thickness of 1-3 μm .

14. The method of Claim 12, wherein the κ -Al₂O₃-layer is deposited in a thickness of 4-8 μ m.
15. The method of Claim 12, wherein the cemented carbide body has a surface zone depleted from cubic carbides and the cubic carbides include TiC, TaC and/or NbC.
16. The method of Claim 12, wherein the cemented carbide body includes 6.5-8.0 wt % Co and has a CW-ratio of 0.80-0.90.
17. The method of Claim 12, further comprising depositing a fourth layer of TiN on the third layer.
18. The method of Claim 17, further comprising removing the TiN-layer on a cutting edge of the insert.
19. The method of Claim 12, wherein $x+y+z=1$ with $z < 0.5$ in the first layer and $x+y+z=1$ with $x > 0.3$ and $y > 0.3$ in the second layer.
20. The method of Claim 12, wherein the third layer is deposited so as to have a grain size of 0.5 to 2 μ m.
21. The method of Claim 17, wherein the fourth layer has a thickness of 0.1 to 1 μ m.
22. The method of Claim 15, wherein the surface zone has a thickness of 15 to 35 μ m.
23. A method of machining a workpiece with a turning insert comprising a cemented carbide body having a coating thereon, the cemented carbide body including WC, 5-11 wt % Co and 2-10 wt % cubic carbides of groups IVb, Vb and/or VIb of

the periodic table and a highly W-alloyed binder phase with a CW-ratio of 0.76-0.92, the coating including a first layer of $\text{TiC}_x\text{N}_y\text{O}_z$ having a thickness of 0.1-2 μm and equiaxed grains $<0.5 \mu\text{m}$ in size, a second layer of $\text{TiC}_x\text{N}_y\text{O}_z$ having a thickness of 3-15 μm and columnar grains $<5 \mu\text{m}$ in diameter, and a third layer of smooth, fine-grained $\kappa\text{-Al}_2\text{O}_3$ having a thickness of 1-9 μm , the method comprising contacting the workpiece with a cutting edge of the insert, moving the insert relative to the workpiece and cutting material from the workpiece in contact with the cutting edge.

24. The method of Claim 23, wherein the workpiece comprises hot or cold forged low alloyed steel.

25. The method of Claim 23, wherein the workpiece comprises stainless steel.

26. The method of Claim 23, wherein the workpiece comprises a gear ring, axle, bar, tube or flange.

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